AURUM

ME215: Thermodynamics I
Test One, 30 January 2019
Closed book. Closed notes. No formula sheet. All test materials needed are in this packet.
No Internet or communication allowed. Calculator is allowed.
100 points

Write your final answers on this problem sheet **AND** make sure your final answers are **clearly identified** in your work. Make sure you turn in **ALL** of your work sheets.

1. **(30)** Match the terms with the appropriate descriptions:

____ Boundary	A. The condition of a system as described by its properties
____ Closed system	B. A property whose value is independent of the size or extent of a system
____ Extensive property	C. Distinguishes the system from its surroundings
____ Intensive property	D. A region of space through which mass may flow
____ Surroundings	E. The region of interest
____ System	F. A property whose value for an overall system is the sum of its values for the parts into which the system is divided
	G. Everything external to the system
	H. A fixed quantity of matter

2. _____kPa **(20)**
Given: The pressure of a gas in a well-sealed vertical frictionless piston-cylinder device is to be increased by adding a mass of 55 kg on the piston. The diameter of the cylinder is 16 cm.

Find: The increase in the pressure of the gas.

3. _____kPa **(20)**
Given: A pressure gage connected to a tank reads 165 kPa at a location where the atmospheric pressure is 76.1 cmHg. The density of mercury is 13,600 kg/m^3.

Find: The absolute pressure in the tank

4. _____feet **(30)**
Given: The difference in atmospheric pressure from the base of a mountain to its summit is equivalent to a manometer reading of 159 inches H_2O. The average specific volume of air is 11.8 ft^3/lbm, and the density of water is 62.4 lbm/ft^3.

Find: The height of the mountain

WRITE NEATLY. IF I CAN'T READ IT, IT'S NOT THERE.